

## ABSTRACT OF THE DISCLOSURE

Devices and methods for non-invasively measuring at least one parameter of a sample, such as the presence of a disease condition, progression of a disease state, presence of an analyte, or concentration of an analyte, in a biological sample, such as , for example, a body part. In these devices and methods, temperature is controlled and is varied between preset boundaries. The methods and devices measure light that is reflected, scattered, absorbed, or emitted by the sample from an average sampling depth,  $d_{av}$ , that is confined within a region in the sample wherein temperature is controlled. According to the method of this invention, the sampling depth  $d_{av}$ , in human tissue is modified by changing the temperature of the tissue. The sampling depth increases as the temperature is lowered below the body core temperature and decreases when the temperature is raised within or above the body core temperature. Changing the temperature at the measurement site changes the light penetration depth in tissue and hence  $d_{av}$ . Change in light penetration in tissue as a function of temperature can be used to estimate the presence of a disease condition, progression of a disease state, presence of an analyte, or concentration of an analyte in a biological sample. According to the method of this invention, an optical measurement is performed on a biological sample at a first temperature. Then, when the optical measurement is repeated at a second temperature, light will penetrate into the biological sample to a depth that is different from the depth to which light penetrates at the first temperature by from about 5% to about 20%.